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(54) **DISPLAY DEVICE AND METHOD OF CONTROLLING ITS BRIGHTNESS**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,748,171 A * 5/1998 Ishizaki et al. 345/101
 6,023,130 A * 2/2000 Sakasegawa et al. 313/582
 6,133,682 A * 10/2000 Murai et al. 313/403
 6,191,505 B1 2/2001 Matsuyama
 6,270,061 B1 8/2001 Bouquet
 6,288,495 B1 * 9/2001 Yashiro 315/169.1
 6,313,821 B1 * 11/2001 Mizuno 345/101
 6,320,568 B1 * 11/2001 Zavracky 345/101
 6,331,843 B1 * 12/2001 Kasahara et al. 345/60

FOREIGN PATENT DOCUMENTS

JP 6-282241 10/1994

JP 9-6283 1/1997
 JP 9-198005 7/1997
 JP 9-288467 11/1997
 JP 10215424 8/1998
 JP 11194745 7/1999
 JP 11212517 8/1999
 JP 11231828 8/1999
 JP 11283228 10/1999
 JP 11288244 10/1999
 JP 2001-200087 7/2001

OTHER PUBLICATIONS

English Language Abstract of JP 11-288244.
 English Language Abstract of JP 11-231828.
 English Language Abstract of JP 9-288467.
 English Language Abstract of JP 11-283228.
 English Language Abstract of JP 11-194745.
 English Language Abstract of JP 2001-200087.
 English Language Abstract of JP 6-282241.
 English Language Abstract of JP 9-6283.
 English Language Abstract of JP 9-198005.
 English Language Abstract of JP 9-288467.
 English Language Abstract of JP 11-212517.
 ITE '98: 1998 ITE Annual Convention, along with a partial English translation.

* cited by examiner

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(57) **ABSTRACT**

A temperature difference estimated value is found from a video signal using a temperature estimated value representing the temperature of the panel outer periphery of a display screen of a PDP and a reference value representing the temperature of the panel outer periphery of the PDP which is outputted from a panel periphery temperature setter by a temperature difference estimator, and the luminance of an image displayed on a display is controlled depending on the temperature difference estimated value by a controller and a brightness controller.

8 Claims, 18 Drawing Sheets

